

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : HENDRIK J. MONKHORST  
Appl. No. : To be assigned  
Filing Date : Filed Herewith  
Title : CONTROLLED FUSION IN A FIELD REVERSED CONFIGURATION  
AND DIRECT ENERGY CONVERSION  
Group Art Unit : To be assigned  
Examiner : To be assigned  
Docket No. : 703538.4019

Mail Stop Patent Application  
Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT**

Sir:

In accordance with 37 CFR §§ 1.97 and 1.98, the items identified in this Information Disclosure Statement ("IDS") are brought to the attention of the Office. The items are listed on the attached form PTO-1449.

The items identified in this IDS may or may not be "material" pursuant to 37 CFR § 1.56. The submission thereof by Applicant is not to be construed as an admission that any such patent, publication or other information referred to therein is material or considered to be material (37 CFR § 1.97(h)), or even qualifies as "prior art" under 35 USC § 102 with respect to this invention unless specifically designated by Applicant as such.

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**CERTIFICATE OF MAILING (37 CFR §1.10)**

I hereby certify, pursuant to 37 CFR §110, that I have reasonable basis to expect that that this paper or fee (along with any referred to as being attached or enclosed) would be mailed or transmitted on or before the date indicated with the United States Postal Service with sufficient postage as Express Mail on the date shown below in an envelope addressed to Mail Stop Patent Application, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

Express Mail Label No. EV 342473150 US

Dated: September \_\_\_\_\_, 2003

Mary L. Smith

Applicant : Hendrik J. Monkhorst  
Appl. No. : To be assigned  
Examiner : To be assigned  
Docket No. : 703538.4019

**INFORMATION DISCLOSURE STATEMENT FILING PROVISION:**

This IDS is believed to be timely in that it is being submitted under 37 CFR § 1.97(b), that is (1) within three months of the filing date of the application, which is not a continued prosecution application filed under § 1.53(d); or (2) within three months of entry of the national stage as set forth in 37 CFR § 1.491; or (3) before the mailing of a first Office action on the merits; or (4) before the mailing of a first Office action after filing a request for continued examination under § 1.114. Thus, no fee is required.

However, if the undersigned is in error in this regard, Applicant respectfully requests that the Office consider this IDS as filed under 37 CFR § 1.97(c), if applicable, and charge the fee due under 37 CFR § 1.17(p) to the deposit account referenced below.

However, if the undersigned is in error in this regard, Applicant respectfully requests that the Office consider this IDS as filed under 37 CFR § 1.97(c), if applicable, and a statement under 37 CFR § 1.97(e) is included below, thus no fee is required.

This IDS is being submitted under 37 CFR § 1.97(c), that is after mailing of a first Office action on the merits, but before a Final Action under 37 CFR § 1.113 or a Notice of Allowance under 37 CFR § 1.311.

The fee due under 37 CFR § 1.17(p) is submitted herewith.

A statement under 37 CFR § 1.97(e) is included below, thus no fee is required. In the event that this IDS is not received before a Final Action or a Notice of Allowance, then Applicant respectfully requests that the Office consider the filing of these papers to be submitted under 37 CFR § 1.97(d) and charge the fee due under 37 CFR § 1.17(p) to the deposit account below.

This IDS is being submitted under 37 CFR § 1.97(d), that is after a Final Action under 37 CFR § 1.113 or a Notice of Allowance under 37 CFR § 1.311, but before payment of the issue fee. A statement under 37 CFR § 1.97(e) is included below. The fee due under 37 CFR § 1.17(p) is submitted herewith.

Applicant : Hendrik J. Monkhorst  
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**STATEMENT UNDER 37 CFR § 1.97(e):**

Each item contained in this IDS was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS.

No item contained in this IDS was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing this statement after making reasonable inquiry, no item of information contained in this IDS was known to any individual designated in 37 CFR § 1.56(c) more than three months prior to the filing of this IDS.

**PAYMENT AND/OR AUTHORIZATION TO CHARGE FEES:**

A check in the amount of \_\_\_\_\_ is enclosed for the above fee(s).

Please charge \_\_\_\_\_ to Deposit Account No. **15-0665** for the above fee(s).

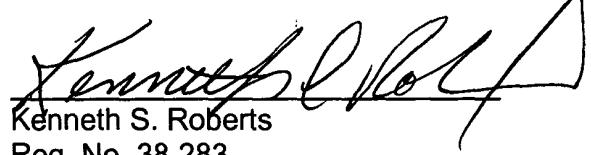
The Commissioner is authorized to charge any fees required by the filing of these papers, and to credit any overpayment to Orrick, Herrington & Sutcliffe's Deposit Account No. **15-0665**.

Respectfully submitted,

ORRICK, HERRINGTON & SUTCLIFFE LLP

Dated: September 9, 2003

By:

  
Kenneth S. Roberts  
Reg. No. 38,283

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LIST OF PATENTS AND OTHER ITEMS FOR APPLICANT'S  
INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

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## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE
AA	3,132,996	5/12/1964	Baker et al.			
AB	3,258,402	6/28/1966	P.T. Farnsworth			
AC	3,386,883	6/4/1968	P.T. Farnsworth			
AD	3,527,977	9/8/1970	Ruark			
AE	3,530,036	9/22/1970	R. L. Hirsch			
AF	3,530,497	9/22/1970	R. L. Hirsch et al.			
AG	4,010,396	3/1/1977	Ress et al.	313	231.3	
AH	4,057,462	11/8/1977	Jassby et al.	176	5	
AI	4,065,351	12/27/1977	Jassby et al.	176	5	
AJ	4,233,537	11/11/1980	Limpaecher	313	231.3	
AK	4,246,067	1/20/1981	Linlor	176	3	
AL	4,416,845	11/22/1983	Salisbury	376	107	
AM	4,548,782	10/22/1985	Manheimer, et al.	376	127	
AN	4,639,348	1/27/1987	Jarnagin	376	107	
AO	4,826,646	5/2/1989	Bussard	376	129	
AP	4,894,199	1/16/1990	Rostoker	376	107	
AQ	3,859,164	1/7/1975	Nowak	176	2	
AR	4,397,810	8/9/1983	Salisbury	376	107	
AS	4,390,494	1/28/1983	Salisbury	376	107	

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	AT	4,347,621	8/31/1982	Dow	376	139	
	AU	4,314,879	2/9/1982	Hartman et al.	376	128	
	AV	4,274,919	6/23/1981	Jensen et al.	176	3	
	AW	4,267,488	5/12/1981	Wells	315	111.7	
	AX	4,202,725	5/13/1980	Jarnagin	176	5	
	AY	4,434,130	2/28/1984	Salisbury	376	107	
	AZ	4,650,631	3/17/1987	Knorr	376	127	
	BA	4,618,470	10/21/1986	Salisbury	376	123	
	BB	4,601,871	7/22/1986	Turner	376	144	
	BC	4,560,528	12/24/1985	Ohkawa	376	121	
	BD	4,543,231	9/24/1985	Ohkawa	376	133	
	BE	4,853,173	8/1/1989	Stenbacka	376	123	
	BF	5,015,432	5/14/1991	Koloc	376	148	
	BG	5,160,695	11/3/1992	Bussard	376	107	
	BG	5,160,694	11/2/1992	Steudtner	376	107	
	BI	5,041,760	8/20/1991	Koloc	315	111.41	
	BJ	5,923,716	7/13/1999	Meacham	376	121	
	BK	6,255,648 B1	7/3/2001	Littlejohn et al.	250	286	
	BL	4,584,473	4/22/1986	Hashimoto et al.	250	251	
	BM	4,347,621	8/31/1982	Dow	376	139	
	BN	4,189,346	2/19/1980	Jarnagin	176	5	

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## FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	Translation
							Yes No
	BO	WO 97/10605	3/20/1997	PCT			

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

BP	Tuszewski, M., "Field Reversed Configurations," Nuclear Fusion, Vol. 28, No. 11, pp. 2033-2092 (1988).
BQ	Tuszewski, M., "Status of the Field-Reversed Configuration as an Alternate Confinement Concept, Fusion Technology, Vol. 15, (Mar. 1989).
BR	Rider, Todd H., "Fundamental limitations on plasma fusion systems not in thermodynamic equilibrium," Phys. Plasmas 4 (4), pp. 1039-1046, April 1997.
BS	Avanzini et al., "Feasibility of Fusion Power Generation by Accelerated Ion Beams," ICENES, pp. 305-309, June 30-July 4, 1986.
BT	Dawson, John M., "Advanced Fuels fo CTR," Four Workshops in Alternate Concepts in Controlled Fusion, EPRI ER-429-SR Special Report, Part B: Extended Summaries, pp. 143-147, May 1977.
BU	Dawson, John M., "Alternate Concepts in Controlled Fusion," EPRI ER-429-SR Special Report, Part C: CTR Using the p- <sup>11</sup> B Reaction, pp. iii-30, May 1977.
BV	"Letters," ISSN 0036-8075, Science, Vol. 278, pp. 2024, 2032-2034, No. 5346, Dec. 19, 1997.
BW	Finn et al., "Field-Reversed Configurations with a Component of Energetic Particles," Nuclear Fusion, Vol. 22, pp. 1443-1458, No. 11, (1982).
BX	Tandem Energy Corporation Presentation, Dec. 12, 1997.
BY	Post, Richard F., "Nuclear Fusion," McGraw-Hill Encyclopedia of Science & Tehcnology, 6 <sup>th</sup> Ed., pp. 142-153, 12 NIO-OZO.
BZ	Rider, Todd H., "A general critique of inertial-electrostatic confinement fusion systems," Phys. Plasmas, Vol. 2, No. 6, Pt. 1, pp. 1853-1870, Jun. 1995.
CA	Dobrott, D., "Alternate Fuels in Fusion Reactors," Nuclear Technology/Fusion, pp. 339-347, Vol. 4, Sept. 1983.
CB	Miley et al., "A Possible Route to Small, Flexible Fusion Units," Energy, Vol. 4, pp. 163-170, Special Issue: 1978 Midwest Energy Conference.
CC	Heidbrink et al., "The diffusion of fast ions in Ohmic TFTR discharges," Phys. Fluids B, Vol. 3, No. 11, pp. 3167-3170, Nov. 1991.
CD	Heidbrink et al., "comparison of Experimental and Theoretical Fast Ion Slowing-Down Times in DIII-D," Nuclear Fusion, vol. 28, No. 10, pp. 1897-1900, plus letters page, (1988).
CE	Becker et al., "Low-Energy Cross Sections for <sup>11</sup> B(p,2 $\alpha$ )*," Atomic Nuclei 327, pp. 341-355, (1987).
CF	Rosenbluth et al., "Fokker-Planck Equation for an Inverse-Square Force," The Physical Review, Vol. 107, No. 1, pp. 1-6, Jul. 1957.
CG	Feldbacher et al., "Basic Cross Section Data for Aneutronic Reactor," Nucl. Inst. and Methods in Phys. Res., A271, pp. 55-64, (1988).

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Applicant:  
Monkhorst and RostokerFiling Date:  
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3614

	CH	Naitou et al., "Kinetic Effects on the Connective Plasma Diffusion and the Heat Transport," J. of the Phys. Soc. of Jap., Vol. 46, No. 1, pp. 258-264, (1979).
	CI	Zweben et al., "Radial Diffusion Coefficient for Counter-Passing MeV Ions in the TFTR Tokamak," Nuclear Fusion, Vol. 13, No. 12, pp. 2219-2245, (1991).
	CJ	Song et al., "Electron trapping and acceleration in a modified elongated betatron," Phys. Fluids B, Vol. 4, No. 11, pp. 3771-3780, Nov. 1992.
	CK	Wong et al., "Stability of annular equilibrium of energetic large orbit ion beam," Phys. Fluids B., Vol. 3, No. 11, pp. 2973-2966, Nov. 1991.
	CL	Davis et al., "Generation of Field-Reversing E Layers with Millisecond Lifetimes," Phys. Review Let., Vol. 37, No. 9, pp. 542-545, August 30, 1976.
	CM	Phelps, et al., "Observations of the stable equilibrium and classical diffusion of field reversing relativistic electron coils," The Phys. of Fluids, Vol. 17, No. 12, pp. 2226-2235, Dec. 1974.
	CN	Weaver et al., "Exotic CTR Fuels: Non-Thermal Effects and Laser Fusion Applications," Paper presented at 1973 Annual Meeting of the Amer. Phys. Soc. Div. of Plasma Physics, Philadelphia, PA, Oct. 30, 1973.
	CO	Weaver et al., "Fusion Microexplosions, Exotic Fusion Fuels, Direct conversion: Advanced Technology Options for CTR," UCID-16309, Apr. 27, 1973.
	CP	Weaver et al., "Exotic CTR Fuels for Direct Conversion-Utilizing Fusion Reactors," UCID-16230, March 16, 1973.
	CQ	Heidbrink, W.W., "Measurements of classical deceleration of beam ions in the DIII-D tokamak," Phys. Fluids B, Vol. 2, No. 1, pp. 4-5, Jan. 1990.
	CR	Cox, et al., Fusion Technology, Vol. 18, pp. 325 – 339
	CS	Rostoker et al., "Colliding Beam Fusion Reactor," Science, Vol. 278, pp. 1419-1422, Nov. 1997.
	CT	Rostoker et al., "Large Orbit Confinement for Aneutronic Systems," Non-Linear and Relativistic Effects in Plasmids, Ed. V. Stefan, Am. Inst. of Phys., New York, pp. 116-135, (1992).
	CU	Rostoker et al., "Magnetic Fusion with High Energy Self-Colliding Ion Beams," Phys. Rev. Let., Vol. 27, No. 12, pp. 1818-1821 (1993).
	CV	Nevins, et al. "Feasibility of a Colliding Beam Fusion Reactor," online available: <a href="http://wysiwyg://66/http://intl.sciencemag.org/cgi/content/full/281/5375/307a">wysiwyg://66/http://intl.sciencemag.org/cgi/content/full/281/5375/307a</a>
	CW	Carlson (dated Aug, 1998) "Annotated Bibliography of p-B11 Fusion," online available: <a href="http://www.ipp.mpg.de/~Arthur.carlson/p-B11-bib.html">http://www.ipp.mpg.de/~Arthur.carlson/p-B11-bib.html</a>
	CX	Carlson, (dated 11/28/1997) "Re: Boron/Proton Colliding Beam Fusion Reactor?" online available: <a href="http://groups.google.com/groups?q=rostok...opuo.fsf%40s4awc.aug.ipp-garching.mpg.de">http://groups.google.com/groups?q=rostok...opuo.fsf%40s4awc.aug.ipp-garching.mpg.de</a>
	CY	Carlson (dated 97-01-04) "Fundamental Limitation on Plasma Fusion Systems no in Thermodynamic Equilibrium," Online available: <a href="http://www.ipp.mpg.de/~Arthur.Carlson/rider.html">http://www.ipp.mpg.de/~Arthur.Carlson/rider.html</a>
	CZ	Carlson (dated 2000/09/14), "Re: Lithium Fission – Why Not?", online available: <a href="http://groups.google.com/groups?q=rostok...v35u.fsi%40suawc.aug.ipp-garching.mpg.de">http://groups.google.com/groups?q=rostok...v35u.fsi%40suawc.aug.ipp-garching.mpg.de</a>
	DA	Carlson (dated 2000/05/10), "Home Page of Dr. A. Carlson" online available: <a href="http://www.rzg.mpg.de/~awc/home.html">http://www.rzg.mpg.de/~awc/home.html</a>
	DB	W.W. Heidbrink, et al. "The Behaviour of Fast Ions in Tokamak Experiments," Nuclear Fusion, Vol. 34, No. 4 (1994)
	DC	L.C. Steinbauer, et al. "FRC 2001: A White Paper on FRC Development in the Next Five Years," Fusion Technology Vol. 30, September 1996
	DD	ROSTOKER, N. et al., <u>Self-colliding beams as an alternative fusion system for D-He<sup>3</sup>/reactors</u> , Current trends in International fusion research. Proceedings of the first International Symposium of Evaluation of Current Trends in Fusion Research, Washington, D.C., November 14-18, 1997, pages 33-41
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3614

DE	ROSTOKER, N. et al., <u>Colliding Beam Fusion Reactor</u> , University of California, Irvine, and University of Florida, Gainesville, FL, pages 1-26 (1997)	
DF	WARE, A et al., <u>Electrostatic plugging of open-ended magnetic containment systems</u> , Nuclear Fusion, December 1969, Austria, vol. 9, no. 4, pages 353-361	
DG	RUGGIERO, Alesandro G., <u>Proton-Boron Colliding Beams for Nuclear Fusion</u> , Proceedings if ICONE 8 8th Int'l. Conference on Nuclear Engineering (April 2-6, 2000, Baltimore, MD), pp. 1-11	
DH	BINDERBAUER et al., <u>Turbulent transprt in magnetic confinement: how to avoid it</u> , Dept. of Physics, University of California, Irvine, CA (4/8/1996)pp. 1-15	
DI	ROSTOKER, N. et al., <u>Self-colliding beams as an alternative fusion system</u> , Proceedings of the International Conference on High Power Particle Beams (10th), San Diego, CA (June 20-24, 1994), pages 195, 196, 198, 200	
DJ	ROSTOKER, N. et al., <u>Comments on Plasma Phys. Controlled Fusion, Self-Colliding Systems for Aneutronic Fusion</u> , Vol. 15, No. 2, pp. 105-120, 1992 Gordon and Breach, Science Publishers S.A., U.K.	
DK	Welcome to Colliding Beam Fusion ( <a href="http://fusion.ps.uci.edu/beam/intro.html">http://fusion.ps.uci.edu/beam/intro.html</a> ) (Copyright 1997), pp. 1-3	
DL	ROSTOKER, NORMAN, <u>Advanced Fusion Energy and Future Energy Mix Scenarios, Abstracts with Programs from 1999 Annual Meeting and Exposition</u> , The Geological Society of America (Oct. 25-28, 1999, Denver, CO),	
DM	DAWSON, JOHN M., <u>Advanced Fuels for CTR</u> , Four Workshops in Alternate Concepts in Controlled Fusion, Electric Power Research Institute, Palo Alto, CA (May 1977), pp. 143-147	
DN	ROSTOKER, NORMAN, <u>Alternate Fusion Concepts</u> , Current Trends in International Fusion Research, edited by Panarella, Plenum Press, New York and London, pp. 489-495	
DO	ROSTOKER, N. et al., <u>Classical Scattering in a High Beta Self-Coller/FRC</u> , AIP Conference Proceedings 311 (Irvine, CA 1993), Physics of High Energy Particles in Toroidal Systems, American Institute of Physics, New York	
DP	ROSTOKER, N. et al., <u>Colliding Beam Fusion Reactor</u> , 12th Inter'l. Conference on High-Power Particle Beams, Beans '98, Haifa, Israel (June 7-12, 1998), Vol. 1, 8 pages	
DQ	ROSTOKER, N. et al., <u>Colliding Beam Fusion Reactor</u> , American Association for the Advancement of Science (11/21/1997), Vol. 278, pp. 1419-1422	
DR	WESSEL et al., <u>Colliding Beam Fusion Reactor Space Propulsion System</u> , Space Tech. and Applications International Forum-2000, edited by M.S. El-Genk (2000 American Institute of Physics, pp. 1425-1430	
DS	WESSEL et al., <u>D-T Beam Fusion Reactor</u> , Journal of Fusiun Energy, Vol. 17, No. 3 (Sept. 1998), pp. 209-211	
DT	ROSTOKER et al., <u>Fusion Reactors Based on Colliding Beams in a Field Reversed Configuration Plasma</u> , Comments Plasma Phys. Controlled Fusion (1997), Vol. 18, No. 1, No. 1, pp. 11-23	
DU	ROSTOKER, <u>Large Orbit Magnetic Confinement Systems for Advanced Fusion Fuels</u> , Final Technical Report, U.S. Department of Commerce, National Technical Information Service (April 1, 1990-Feb. 29, 1992)	
DV	MILEY, G.H. et al, "On Design and Development issues for the FRC and Related Alternate Confinement Concepts," 6th IAEA Technical Committee Meeting and Workshop on Fusion Power Plant Design and Technology, Culham, UK, 24-27 March 1998, vol. 48, no. 3-4, pages 327-337	
DW	KALINOWSKY, H "Deceleration of Antiprotons from MeV to keV Energies" Antihydrogen Workshop, Munich, Germany, 30-31 July 1992, Vol. 79, no. 1-4, pages 73-80	

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